ENDANGERED SPECIES ASSESSMENTS

U.S. EPA OFFICE OF PESTICIDE PROGRAMS
ENVIRONMENTAL FATE AND EFFECTS DIVISION

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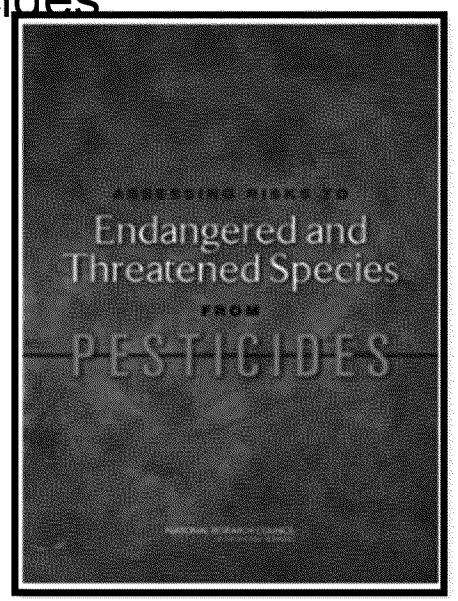
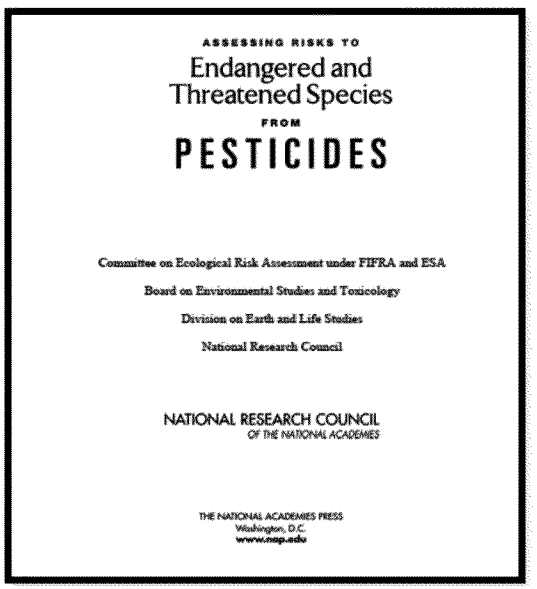
Introduction

- Endangered Species Act (ESA)
  - Section 7 requires federal agencies to consult with the Services* on actions that may affect a federally listed species
    - Section 7(a)(2) of ESA: EPA makes "effects determination" for individual listed species in a biological evaluation (BE):
      - No effect (NE) – no consultation required
        - Overview Document-compliant method (old): Risk Quotient (RQ) < listed species Level of Concern (LOC)
        - NAS-recommended method (new): No geospatial co-occurrence of pesticide use footprint with listed species range
      - Not likely to adversely affect (NLAA) – informal consultation; concurrence from Services
      - Likely to adversely affect (LAA) – formal consultation including BiOp from Services
- Conventional pesticide decisions impacted by ESA:
  - Registration review actions
  - New chemical registrations
  - New use registrations
  - Section 18 Emergency Exemptions
  - Section 24(c) Special Local Need (SLN) registrations

Introduction

- Pesticide registration that involve nationwide use on multiple sites have the potential to cause direct/indirect effects to majority of 1850 listed species
- First national-level pesticide ESA consultations
- Following the recommendations of the 2013 National Academy of Sciences' (NAS) (National Resource Council) report on assessing risks to endangered and threatened species from pesticides



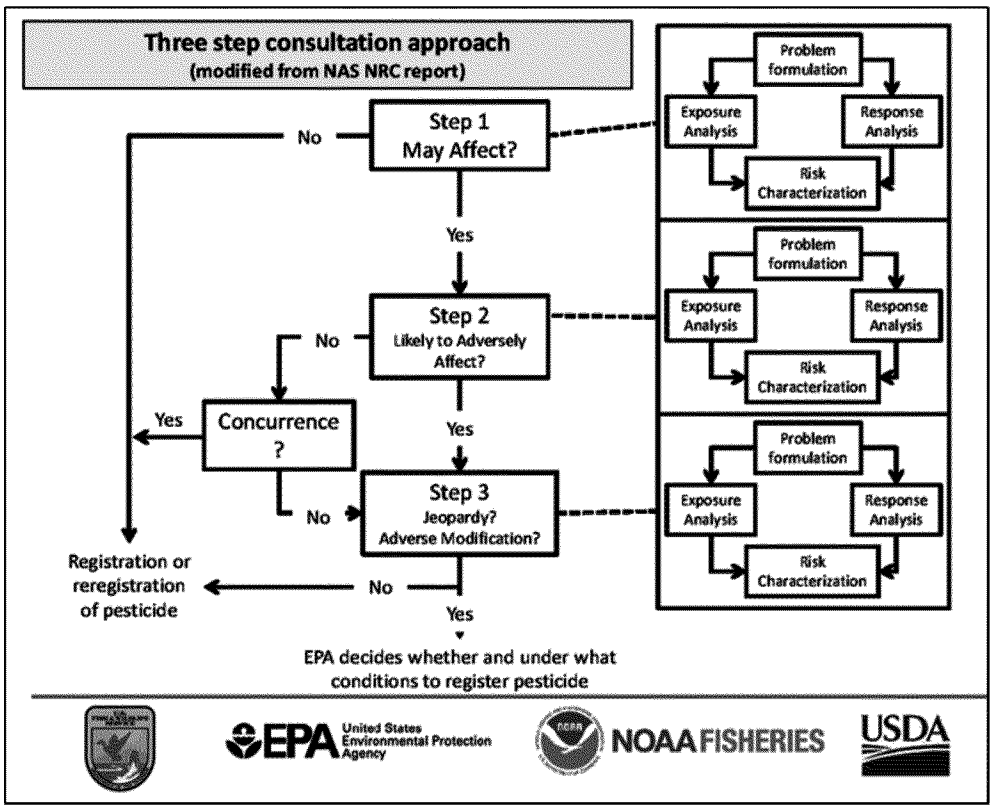


*Services = National Marine Fisheries Service and the United States Fish and Wildlife Service

Background

- Collaborative effort among the:
  - United States Environmental Protection Agency (EPA)
  - National Marine Fisheries Service (NMFS)
  - United States Fish and Wildlife Service (FWS)
  - United States Department of Agriculture (USDA)

- November 2013 – release of interim scientific methods for implementing NAS recommendations
  - https://www.epa.gov/endangered-species/implementing-nas-report-recommendations-ecological-risk-assessment-endangered-and
  - The draft process follows the 2013 NAS recommendations for a 3-step approach:

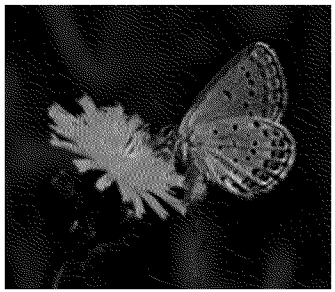


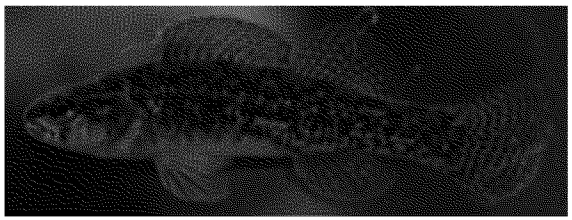
Background

- Conducted as part of EPA's Registration Review Process
  - Registration Review – the EPA periodically reviews all pesticides to ensure they meet current standards for human health and environmental safety
- Interim scientific method developed in 2013 - 2015
  - Interagency meetings and stakeholder workshops
- First "pilot" chemicals (organophosphate insecticides):
  - chlorpyrifos, diazinon, malathion
    - Public comment period 2016
- Second chemicals (carbamates insecticides)
    - carbaryl and methomyl

Consultation Process

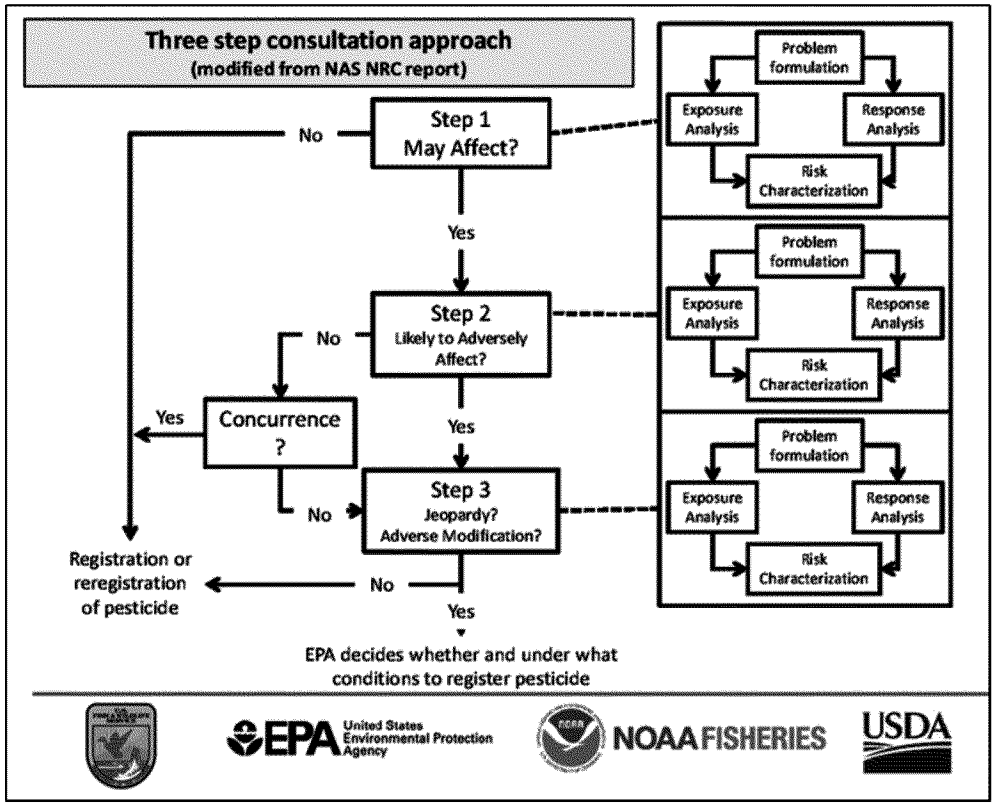
- EPA's risk assessment (*i.e.*, the Biological Evaluation) that serves as the basis for the Services' Biological Opinion



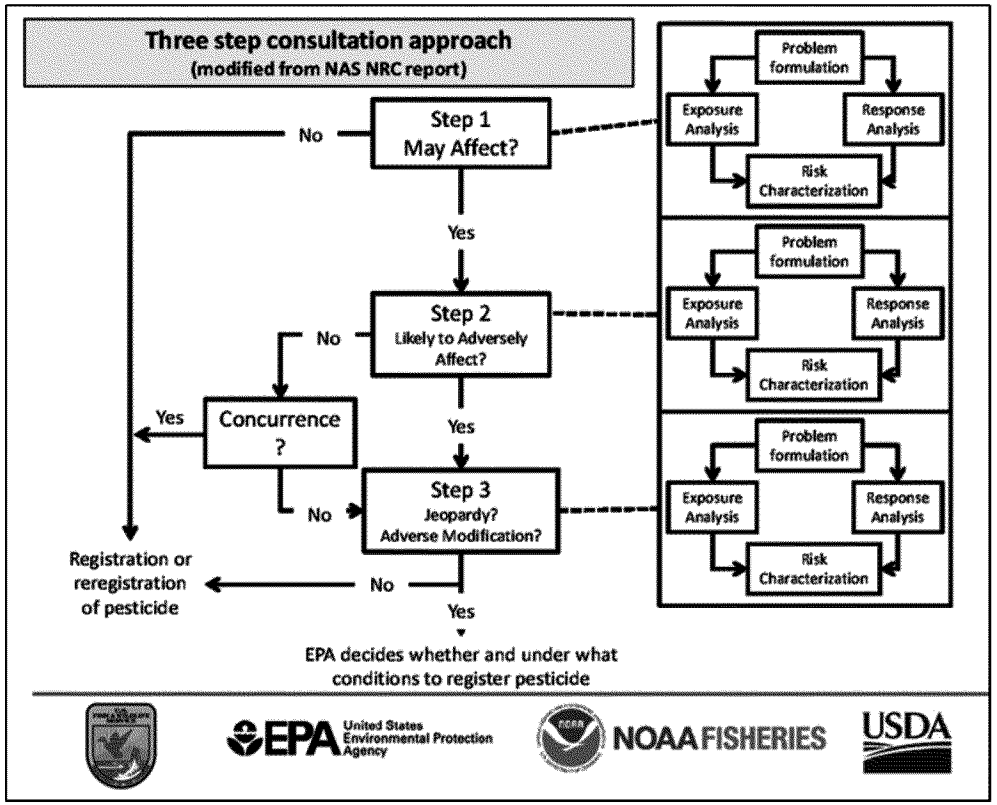
Biological Evaluation (BE)

- The BE determines whether registered pesticides adversely affect one or more individuals of a listed species and their designated critical habitats
  - **Step 1** ["No Effect/May Affect" Determination]
  - **Step 2** ["Not Likely to Adversely Affect (NLAA)/Likely to Adversely Affect (LAA) Determination]



Biological Opinion (BiOp)

- The Biological Opinion (BiOp or BO) determines whether registered pesticides result in 'jeopardy' for a listed species or 'adverse modification' of designated critical habitat
  - **Step 3** ["Jeopardy/No Jeopardy" Determination and "Adverse Modification/No Adverse Modification" Determination]



Draft BE Aquatic Exposure Modeling

- Estimating aquatic exposures
  - Use current aquatic models available in EFED
  - Regional (HUC 2) scale modeling of pesticide applications to variety of waterbodies
    - 3 flowing, 3 static, and 3 estuarine/marine
  - Regional use scenarios developed by modifying existing use scenarios to reflect weather in region

HUC 2 map of the continental US

Draft BE Aquatic Exposure Modeling

- Estimating aquatic exposures
  - Aquatic Bins:

Generic Habitat	Depth (meters)	Width (meters)	Length (meters)	Flow (m^3/s)
1 – Aquatic-associated terrestrial habitats	NA	NA	NA	NA
2- low-flow	0.1	2	Length of field[1]	0.001
3- Moderate-flow	1	8	Length of field[1]	1
4- High-flow	2	40	Length of field[1]	100
5 – Low-volume	0.1	1	1	0
6- Moderate-volume	1	10	10	0
7- High-volume	2	100	100	0
8- Intertidal nearshore	0.5	50	Length of field	NA
9- Subtidal nearshore	5	200	Length of field	NA
10- Offshore marine	200	300	Length of field	NA

[1] length of field – The habitat being evaluated is the reach or segment that abuts or is immediately adjacent to the treated field. The habitat is assumed to run the entire length of the treated area.

Draft BE Aquatic Exposure Modeling

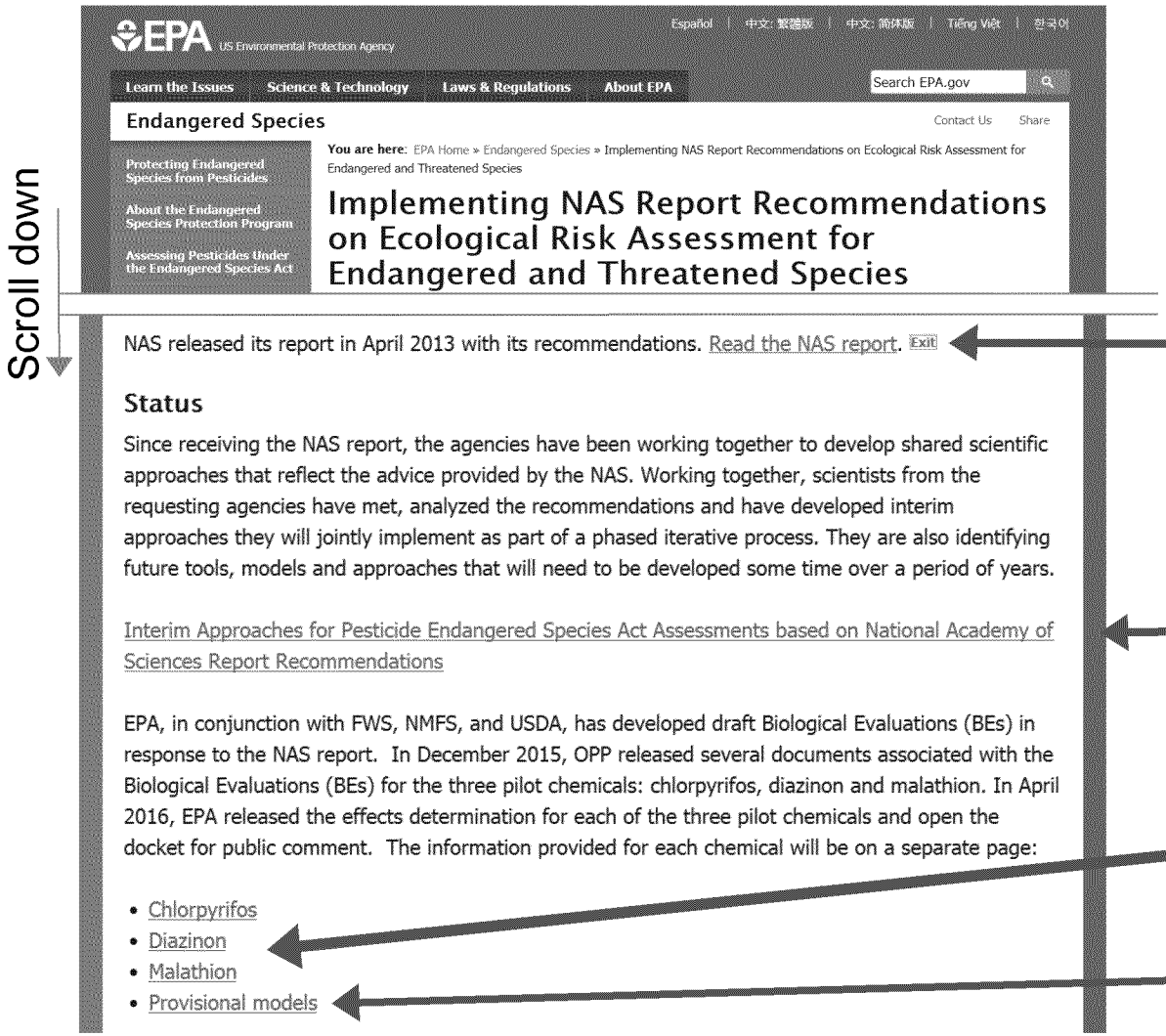
- Estimating aquatic exposures
  - Updates to tools
    - Pesticide in Water Calculator (PWC)
    - New use scenarios
    - Ability to batch run hundreds to thousands of files
  - PWC Postprocessor
    - Spreadsheet tool designed to postprocess PWC runs and generate graphs and tables to assist in making an effects determination
    - Generates:
      - Probability distribution
      - Spread of EECs by Julian date
      - Number of exceedances per month
      - Exceedance determination for each species in HUC 2 and aquatic bin

Navigating the Documents

The draft BEs (and supporting documents) can be found at: https://www.epa.gov/endangered-species/implementing-nas-report-recommendations-ecological-risk-assessment-endangered-and

Navigating the Documents

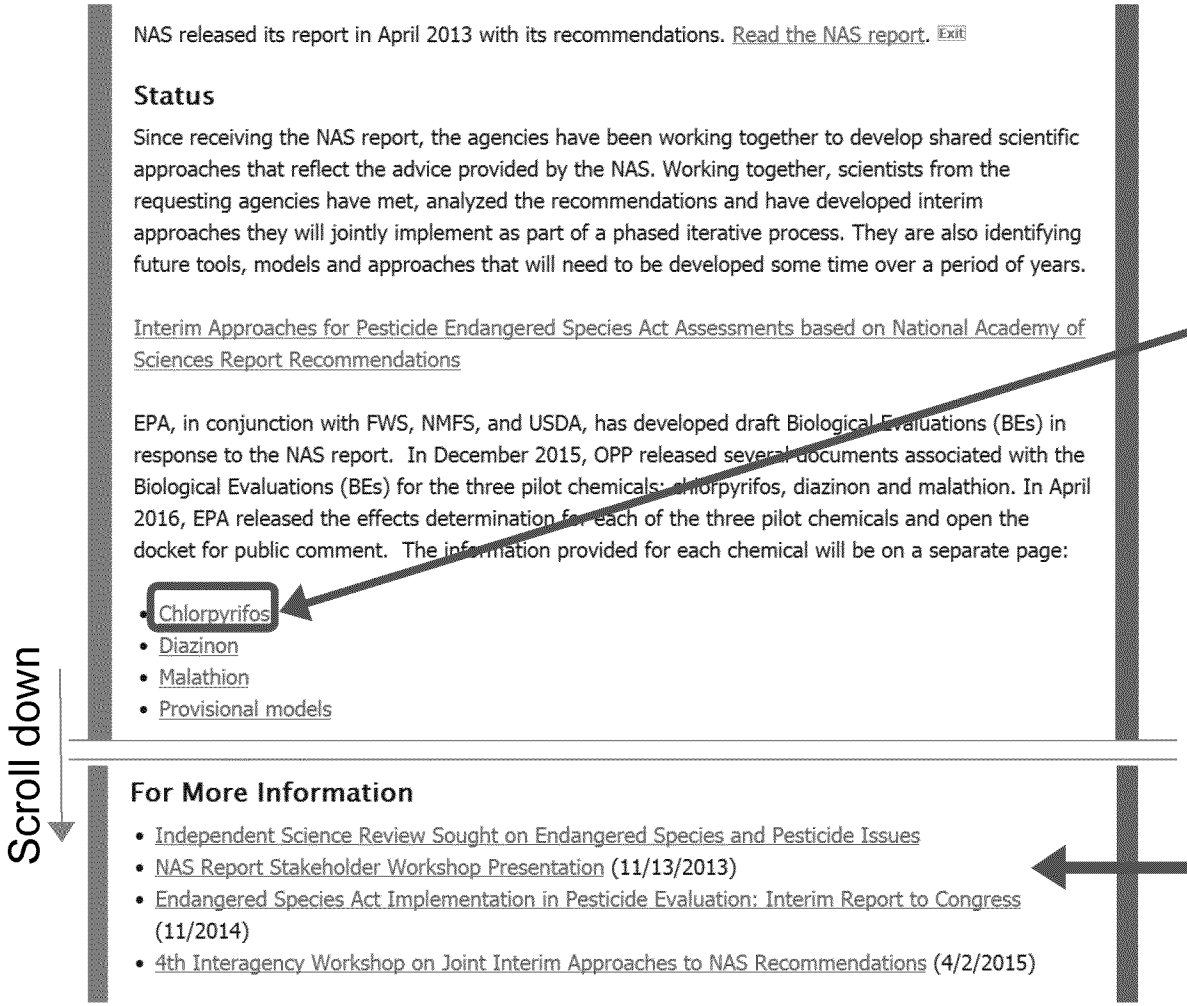
Scroll down to find the following links:



QUESTIONS

Navigating the Documents

Scroll down to find the following links:



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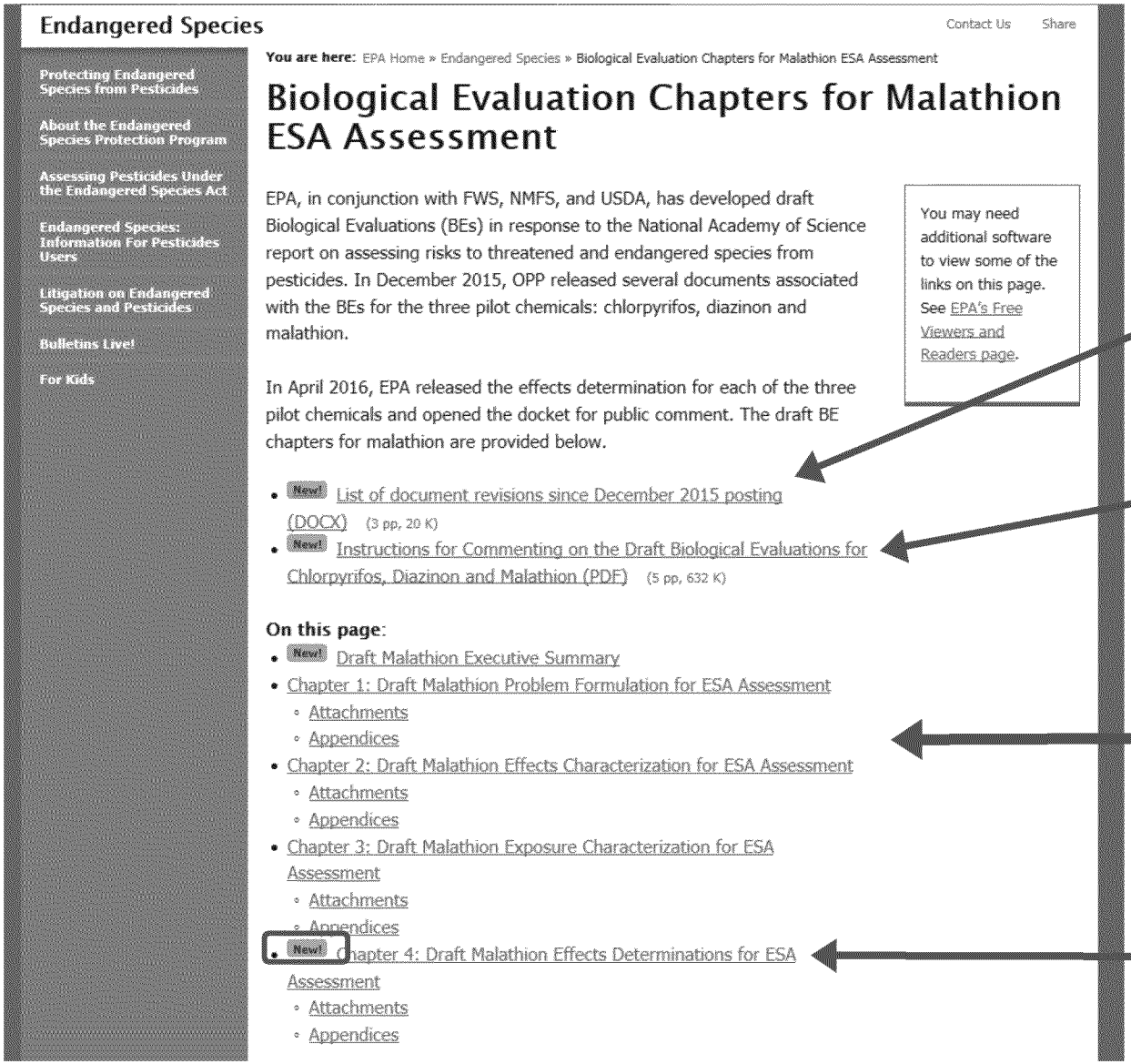
Additional Information

Navigating the Documents



List of document revisions (since the Dec. 2015 posting)

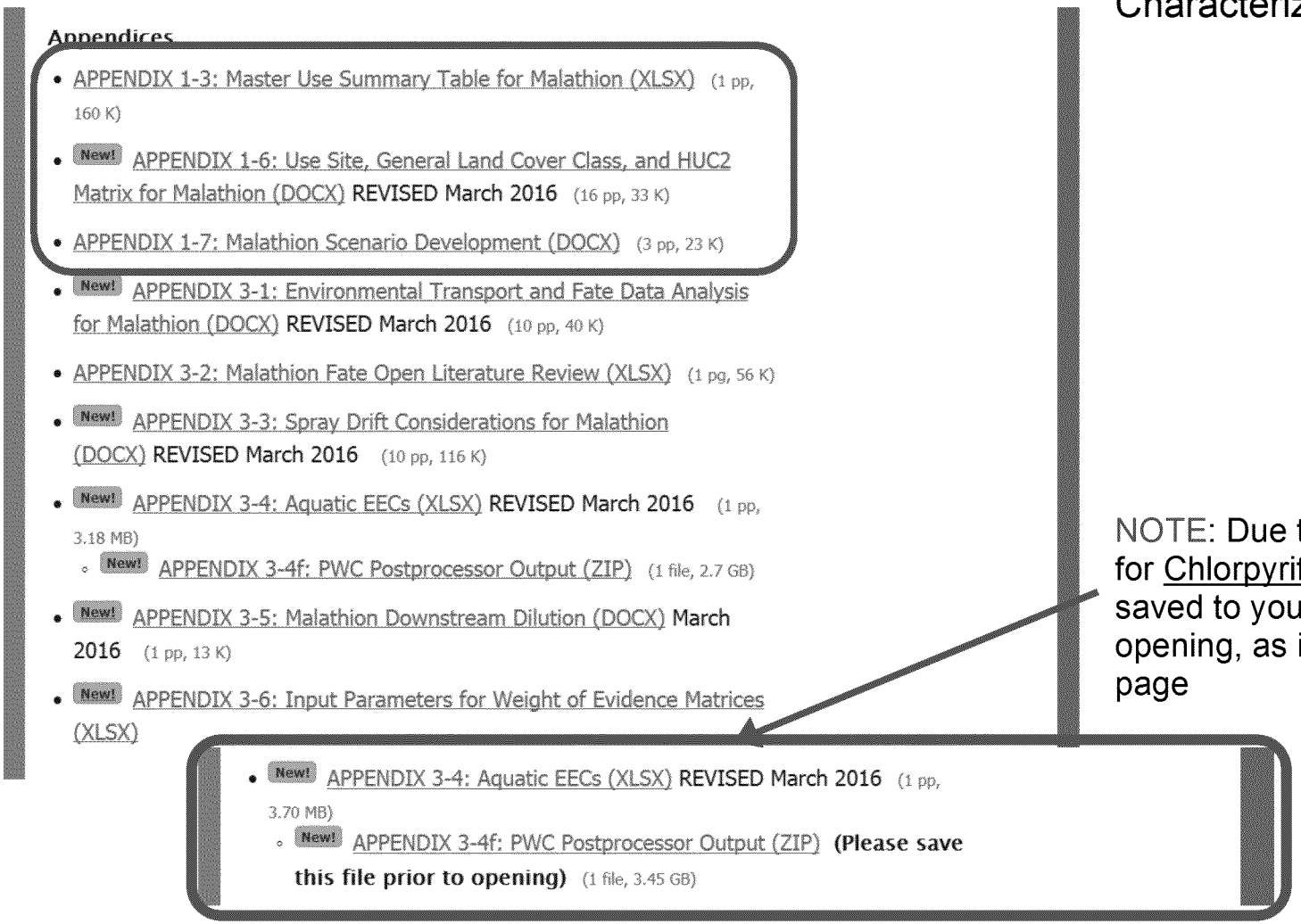
Instructions for commenting on the draft BEs

Hyperlinks to location on page where you can find BE chapters and associated documents

New! = a 'new' or 'revised' document (since the Dec. 2015 posting)

Navigating the Documents

Chapter 3 (Exposure Characterization) Appendices



Appendices

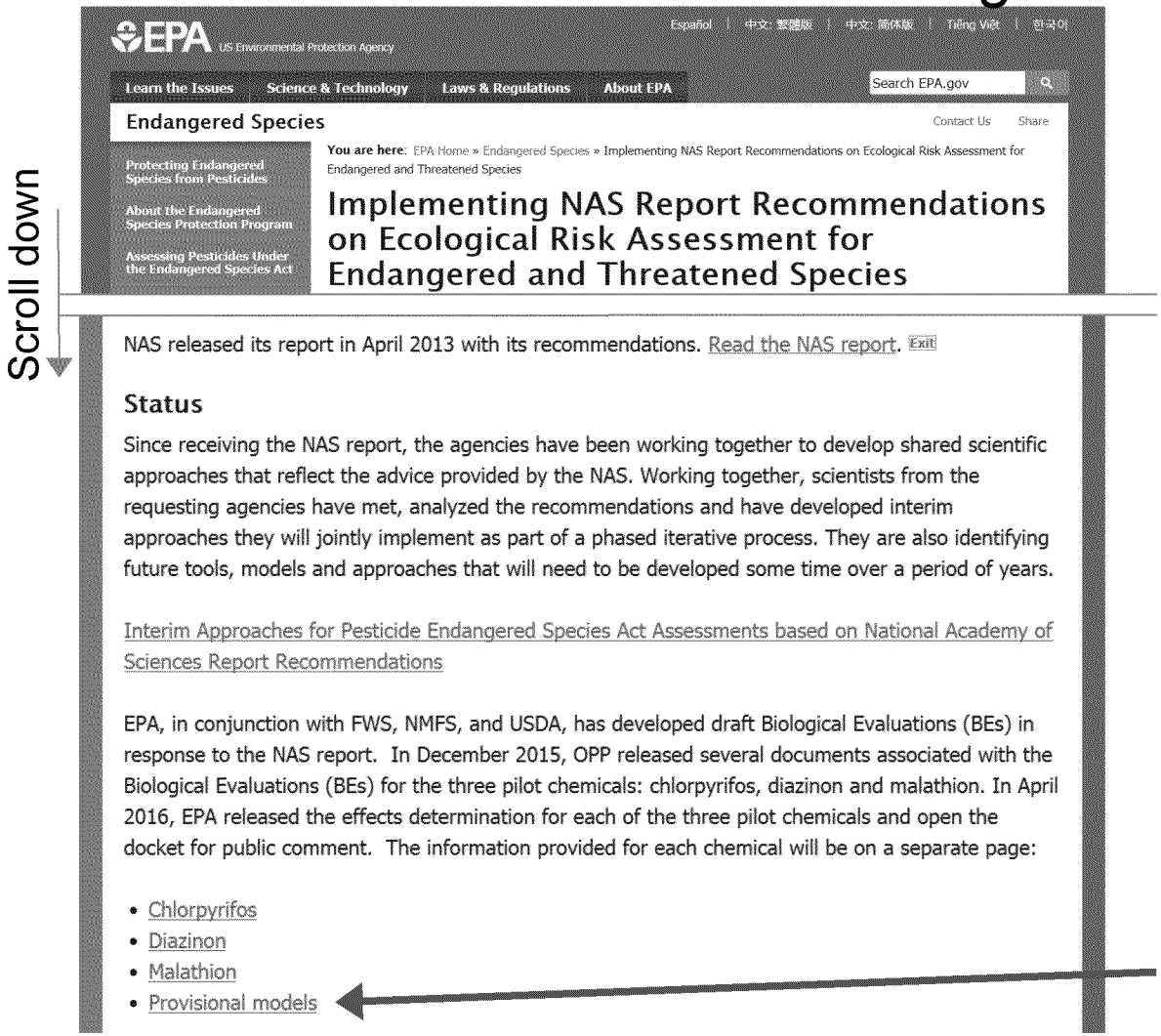
- APPENDIX 1-3: Master Use Summary Table for Malathion (XLSX) (1 pp, 160 K)
- New! APPENDIX 1-6: Use Site, General Land Cover Class, and HUC2 Matrix for Malathion (DOCX) REVISED March 2016 (16 pp, 33 K)
- APPENDIX 1-7: Malathion Scenario Development (DOCX) (3 pp, 23 K)
- New! APPENDIX 3-1: Environmental Transport and Fate Data Analysis for Malathion (DOCX) REVISED March 2016 (10 pp, 40 K)
- APPENDIX 3-2: Malathion Fate Open Literature Review (XLSX) (1 pg, 56 K)
- New! APPENDIX 3-3: Spray Drift Considerations for Malathion (DOCX) REVISED March 2016 (10 pp, 116 K)
- New! APPENDIX 3-4: Aquatic EECs (XLSX) REVISED March 2016 (1 pp, 3.18 MB)
  - New! APPENDIX 3-4f: PWC Postprocessor Output (ZIP) (1 file, 2.7 GB)
- New! APPENDIX 3-5: Malathion Downstream Dilution (DOCX) March 2016 (1 pp, 13 K)
- New! APPENDIX 3-6: Input Parameters for Weight of Evidence Matrices (XLSX)

- New! APPENDIX 3-4: Aquatic EECs (XLSX) REVISED March 2016 (1 pp, 3.70 MB)
  - New! APPENDIX 3-4f: PWC Postprocessor Output (ZIP) **(Please save this file prior to opening)** (1 file, 3.45 GB)

NOTE: Due to the size of this file for Chlorpyrifos, it needs to be saved to your computer before opening, as indicated on the web page

Navigating the Documents

- Scroll down to find the following links:



Navigating the Documents

Provisional models and tools can be found at: https://www.epa.gov/endangered-species/provisional-models-endangered-species-pesticide-assessments